Committee on Resources

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Testimony

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Oversight Hearing on **"Wildlife Conservation on National Forests"**

Introduction

Thank you for the opportunity to testify here on an issue central to management of our National Forests and vital to conserving the many plant and animal species that depend on these lands. I am here as an independent scientist and do not represent any particular interest group. I am trained as an ecologist and work as an academic scientist at the University of Wisconsin - Madison. I have spent much of my professional career over the past 15 years investigating the complex relationships between wildlife and forests trying to understand the mechanisms that threaten small populations with extinction. This research has been supported by the National Science Foundation and the USDA Competitive Grants program. I teach courses in ecology, evolution, & conservation biology and so participate in training the professionals that staff our resource agencies. I am a friend and collaborator with several US Forest Service scientists who share my interest in understanding the ecology of forest landscapes and the processes that now threaten many elements of biodiversity with oblivion. I also cochaired the Wisconsin Scientific Roundtable on biological diversity issues for the USFS in 1992, an activity for which I and my two co-chairs won an Honor Award from the Eastern Region of USFS. Finally, my coauthors and I summarized much of what we learned about the relevance of conservation biology for public forest management in the book: **Wild Forests: Conservation Biology and Public Policy.** I attach a chapter (Chap. 5) as an addendum to this testimony for its relevance to today's topic of wildlife and forest management.

Today, I would like to address the Chair and Committee on an issue that concerns all of us here: how the science in wildlife ecology and conservation biology has progressed in recent decades. In this testimony, I will emphasize how the predominant paradigm in wildlife ecology (that edges are good for wildlife) has shifted greatly in response to our deeper scientific understanding of ecological relationships. This shift has many implications for forest management which I hope will become clear.

Before considering current conditions and opportunities in the National Forests, let us consider several

factors influencing the context for national forest management:

I . **Threats to wildlife have grown and changed in kind in the last century.**

2. Our ancestors a century ago faced catastrophic losses of many wildlife species due mostly to overhunting. As homesteaders and colonists poured across the continent, they extirpated or severely reduced populations of most large ungulates (moose, caribou, elk, woodland bison, plains bison, white-tailed deer, etc.), large and medium sized carnivores (cougar, gray and red wolf, wolverine, pine marten, etc.), beaver, and many bird species (Carolina parakeet, passenger pigeon, and many waterfowl). Market hunting and trapping, in particular, caused the demise of many of these species. In response, Congress enacted laws at the turn of the century to protect bird, fish and other wildlife populations. In addition, hunter ethics evolved to oppose crass over-exploitation.

Today, our wildlife species face a different and in many ways more difficult set of threats. Habitat loss, habitat fragmentation, the invasion of exotic species, and shifts in ecological relationships and dominant disturbance regimes now collectively act to threaten many species (Noss and Cooperrider 1994; Alverson et al. 1994). These threats are often the indirect, subtle, and unintended consequence of human activities. Thus despite game protection laws and the Endangered Species Act, we see continuing declines in many edge-, area-, and isolation-sensitive species. Our extensive western National Parks have proved to be too small and perhaps too popular to sustain many large mammal species (Newmark 1986, 1987). Since the National Forest Management Act was passed in 1976 and despite its provisions to "maintain and enhance" biological diversity, more than 192 species with much or most of their habitat on National Forest lands have been listed as federally threatened or endangered. This reflects both overall patterns of landscape modification and, in some instances, local patterns and intensities of timber harvest that threaten sensitive species. Fortunately, our scientific understanding of these threats has also increased greatly in recent decades.

2. Concepts of 'wildlife' and wildlife-habitat relations have shifted greatly in recent decades.

As our scientific understanding of ecology and conservation biology has grown over the past 30 years, so have concepts of 'wildlife' and wildlife-habitat relations in both ecology and wildlife management. While 'wildlife' used be a synonym for game bird and mammal species, most wildlife professionals and the general public now take it to refer to a much fuller range of game and non-game animal species. (Some of us, in fact, consider the term broad enough to include plants.) Nevertheless, some still use the term to refer primarily to game bird and mammal species, sometimes creating confusion.

Since Aldo Leopold initially documented and emphasized how several game species thrive near edges between contrasting habitats, wildlife managers often sought to maximize the amount of edge habitat in the lands they oversee. Until the mid- 1970's, this paradigm was hardly questioned. Standard wildlife texts (e.g., Yoakum and Dasmann 1971) advocated creating as much edge as possible. Flaspohler and Temple (1998) note that this created a convenient alliance between intensive forest and intensive 'wildlife' managers:

3. Such a broad interpretation of a very specific phenomenon allowed an alliance to form between wildlife managers and foresters. Intensive forest management generated lots of forest edges, which were viewed coincidentally as enhanced habitat for wildlife. We will call this seemingly "win-win" integration of forestry and wildlife management the "beneficial edge paradigm." Even though Leopold and others recognized that there were also negative consequences of creating edges, few ecologists and even fewer resource managers questioned the paradigm until the late 1970s. The first rumblings of change came from studies that looked at the effects of forest edges on non-game species, especially birds (Gates and Gysel 1978, Brittingham and

Temple 1983). As more research accumulated, it became clear that many organisms were being impacted negatively by the creation of forest edges and the fragmentation of forest habitat. For some bird species, negative edge effects included elevated rates of nest predation and brood parasitism by the Brown-headed cowbird which dramatically reduced avian productivity (Brittingham and Temple 1983, Wilcove 1985, Robinson et al. 1995). ...

The simple prescription of "develop as much edge as possible" and the resulting alliance between game managers and forest managers is no longer tenable. Instead, forest managers must collaborate with wildlife ecologists, conservation biologists, landscape ecologists and ecosystem managers to devise ways to minimize the negative impacts of forest edges on biological diversity by carefully planning the temporal and spatial patterns of forest edges across landscapes.

Ch. 5: "From Hero to Villain: Edge Effects"). Here, we also document that the species that benefit from abundant edge habitat are usually already relatively abundant, ecologically resilient, and hence rarely threatened in terms of shrinking numbers or range. In fact, several of these edge-loving species (e.g., white-tailed deer) have reached such high abundance's that they represent public nuisances and threats to many other elements of forested ecosystems (Alverson et al. 1988; Waller & Alverson 1997). (At least two books and an issue of the Wildlife Society Bulletin have been devoted to the problem of deer overabundance, including the habitat conditions that foster such high densities.) In contrast, many edge-sensitive species (those that decline in direct or indirect response to nearby edge habitat) are rare and/or declining across much of their range. Because edges threaten far more species than they benefit, they have gained a 'villain' reputation among many conservation biologists. While scientists are wary of generalizations, conservation biologists are of one mind when it comes to the pernicious effects of habitat loss and fragmentation.

3. As particular habitats and landscape configurations have become scarce and/or fragmented, species that depend on them have declined.

Conservation biologists place particular emphasis on scarce and declining species, including those on state and federal threatened and endangered lists, as these are the species most at risk. It is obvious that we should concentrate on these species, both because we are at risk of losing them permanently and because jeopardy decisions regarding such species can cause major economic dislocations under the Endangered Species Act (the 'train wrecks' we all wish to avoid).

Edge effects and associated habitat fragmentation are major threats for many threatened and endangered species (and even the forest itself in some situations - see references above). Providing appropriate extensive habitats for such species is both economically efficient and ecologically wise. In contrast, those species that benefit from early successional habitats, anthropogenic edges, or areas of high road density or proximity to human settlements rarely require special attention as they continue to thrive across the large parts of our landscape that provide these habitats.

In general, the wildlife that most needs our care and protection will certainly not benefit from, and may be greatly harmed by, the direct and indirect effects of logging, including road construction, edge effects, and forest fragmentation. In contrast, the species that benefit from early successional habitats and abundant edge are already generally abundant, pervasive, and in no risk of extirpation or extinction. Thus, intensive timber harvests (even salvage logging) and the accompanying road-building, stand conversion, and habitat fragmentation they create, can no longer be said to be good for wildlife. Rather, they often tend to threaten just those edge-, area-, and isolationsensitive species most at risk of decline or extinction. Similarly, proposals to increase logging in order to better serve needs of 'wildlife' species are suspect.

4. National Forests play a unique and vital role in providing habitat for a wide set of wildlife species

The National Forests are uniquely situated by virtue of their vast scale, geographic location, and the Congressional mandates laid down for their management to serve as primary habitat for many of this country's most edge-, area-, and isolationsensitive species. Thus, our national forests serve as a de facto first line of defense to protect these species from widespread declines or extinction. These species deserve the habitats that remain for them on our National Forests as well as wise and scientifically informed management of these lands to avoid further threats and declines in population density.

5. **Forests of the Eastern and Midwestern US are drastically different from historically dominant forests of the region and continue to recover.**

Forest landscapes across the eastern and Midwestern US continue to recover from the massive cut-overs they experienced. These changes exceeded any other form of ecological change since the glaciers in scale and speed, leading Forest Service research scientist Dr. Dave Cleland to conclude "there is no historical analog for most of today's landscapes of the Lake States in terms of forest composition, structure, patch sizes and configurations, and age class distributions." Mature and old-growth forest habitats remain only a small fraction of their original extent in the upper Midwest. For example,

Frelich (1995) estimates that only 1. 1 % of the primary forest remains in the Lake States (40% of which is in the Boundary Waters Canoe Area which experienced a catastrophic blowdown on July 8 this year). He estimates that only 3. 1 % of the forests in the region qualify as old-growth (> 80 or 120 years old, depending on forest type) compared with 68% at the time of European settlement. Furthermore, drastic changes in age structure have occurred (e.g., from 89% to 2. 1 % old growth in northern hardwoods and from 55% to 1.5% old growth in mixed pine forests).

In contrast, private industrial and non-industrial forest lands, farm- fields and edges, local parks and meadows, and the more intensively managed public lands (including County, State, and National Forests) all provide plentiful habitat for early successional species and those that thrive near edges (including many game specie * s). For example, in Wisconsin, my colleague John Cary has estimated that early successional

Aspen forests cover 15% of private non-industrial forest land, 28-40% of the national forests, 50% of the state forests, 80% of the County forests, and 90% of the private industrial forest land. We are certainly at no risk of losing extensive amounts of early successional habitat in the upper Midwest or the wildlife species that benefit from them such as ruffed grouse and white-tailed deer. Although early successional habitats are declining in certain areas, continued forest harvest activities ensure ample habitats for these species which tend to be naturally resilient (and often to experience population cycles) in any case.

6. Some National Forests have experienced high and ecologically inappropriate rates of cutting, threatening some species of wildlife.

The debacles involving the Spotted Owl, Marbled Murrelet, and scores of salmonid stocks in the Pacific and Inter-mountain West have amply demonstrated the ecological (and political) dangers of over-harvesting public forest lands. More recently, expanding timber harvests under the guise of 'forest health' and 'salvage sales' have also created ecological mischief and political fallout.

There are good ecological reasons to consider logging and other forms of management in particular situations. However, using 'forest health' as a cover for ecologically inappropriate logging undermines both

responsible stewardship and the credibility of National Forest managers. Such projects should always be evaluated with an eye to both their potential effects on rare and sensitive species (e.g. of top carnivores) and their economic efficiency. When such cuts satisfy neither the 'smell test' nor the glare of scientific scrutiny, they only serve to increase public disillusion and cynicism.

I am encouraged by recent trends which may reflect changes in leadership and direction within the Forest Service. While the agency's timber program expanded greatly after WW H and particularly during the 1980's, unsustainable rates of cutting have declined during the 1990's. In addition, the agency appears sincere in shifting timber management activities away from timber (saw log and pulp) production and more toward stewardship purposes (protecting watersheds, wildlife habitats, and other multiple uses). Its mission appears to be returning to its original goals to "protect and conserve" the public lands after decades of being forced to produce high volumes of timber. This is, of course, both biologically necessary (to protect rare and threatened species) and legally necessary (to obey the Endangered Species Act and NFMA). It is also politically appropriate given the obvious public concern for biotic resources, the fact that many timber sales lose taxpayer money, and the need to restore public trust and accountability.

7.In adopting Ecosystem Management, the Forest Service has embraced broadened concerns to sustain all species. Modern conservation science is critical for achieving this goal.

The Forest Service has now moved beyond dated and inaccurate concepts regarding wildlife and habitat management. Seven years ago last month the Forest Service adopted Ecosystem Management as a guiding philosophy for National Forest management. It was introduced in 1993 in response to overwhelming internal and external pressures for more ecologically informed management. Assoc. Chief Dave Unger described Ecosystem Management before the US Senate in Nov. 1993 as "a holistic approach to natural resource management" that moves beyond local projects to focus "on the forest landscape and its position in the larger environment." He added that "the attention of land managers must be directed to understanding the structure, function, and variability of ecosystems" which would require "an accelerated scientific effort and the efficient incorporation of science into on-the-ground projects."

Remarkably, to some skeptics, this appears to be happening. Formally, at least, the Forest Service is committed to considering the full range of plant and animal species, as well as the structure, composition, and functioning of the ecosystems they depend on. Comprehensive regional ecological assessments have been conducted in the Pacific NW, the Sierra Nevada, the southern Appalachians, and the Lake States allowing, for the first time, evaluation of regional threats to diversity and incorporating landscape-scale processes into forest planning. These Regional Assessments are an essential element of informed management and deserve continued support at an adequate level.

The 2 nd Committee of Scientists created under the 1976 NFMA has just published its report, reaffirming the primary importance of protecting biological diversity, noting how protecting the most threatened elements of diversity must take precedence over other goals, and recommending continuing involvement of independent scientists via the establishment of an oversight committee. These recommendations are remarkably congruent with the Report from the Wisconsin Scientific Roundtable, reflecting the clear consensus that exists within the scientific community regarding both appropriate priorities and the steps we need to adopt to achieve these goals.

Solid and up-to-date conservation and wildlife science is central to Ecosystem Management as managers need to know what the conditions on the land are, what threats exist, and how management activities are affecting fish and wildlife populations. You would not ask the pilot of a 747 or the manager of a nuclear

power plant to work without instruments. Yet managers of our 193 million acres of federal lands have an even more complex job when they try to manage ecosystems while lacking critical information.

8.The role of science has grown greatly in managing the National Forests, yet budgets have not kept pace.

As noted above, excellent science is needed to accomplish the kind of long-term landscape-scale planning and management that Congress has directed and the public demands. Threats to wildlife and biodiversity are numerous and complex, demanding current data, robust models, and critical analysis. To reduce or abandon current efforts to incorporate science (or to return to outmoded concepts of wildlife and habitat) would repudiate the will of Congress as expressed in MUSY of 1960, NEPA of 1970, and the NFMA of 1976. It would also repudiate the clear directives laid down by two separate Committees of Scientists charged with making recommendations regarding National Forest management.

Funding for both research and Wildlife and Fisheries,management activities across the National Forests appear to be seriously deficient. Funding for wildlife and fisheries activities have been dwarfed by funding for timber programs. From 1960 to 1985, Fish & Wildlife activities accounted for only a few percent of US Forest Service budgets compared to the more than 60% devoted to timber management and harvest activities (Sample 1990). The lack of timely and critical information that resulted from this chronic underfeeding has added fuel to the controversy and conflicts over National Forest management. I therefore strongly endorse the agency's request to increase its Wildlife and Fisheries budget from $100 to $124 million. I also urge the Forest Service to put these funds to good use by committing themselves to good science and its regular use in Ecosystem Management. To ignore basic science and the recommendations of leading scientists inside and outside the agency is to deny the role of science in ecosystem management and to abandon a quarter century of hard-won scientific understanding.

In addition to not adequately funding science and wildlife activities on the National Forests, Congress has sometimes laid down contradictory incentives and conflicting directions to the Forest Service via the line-item budget process. This compromises the agency's abilities to respond globally and appropriately to the challenges it faces. Ironically, Forest Service personnel have told me instances where much or most funding for basic biotic inventories and wildlife management programs have had to come from the funds generated by timber cutting (via the KnutsonVandenberg Act of 1930 that allows Forests to retain funds from timber sales associated with reforestation). In addition, as O'Toole (1988) has pointed out, a number of economically perverse incentives act to favor timber cutting over other forms of management even when such activities cost taxpayers money. Cheap taxpayer subsidized timber coming off the National Forests also undercuts prices and thus economic opportunities for private woodland owners. This, in turn, could undercut the ability of private forestland owners to manage their own lands in a more sustainable and . ecologically beneficial manner, particularly in the eastern and Midwestern U.S. where private forestlands predominate.

As I see it, we each have our roles:

• Scientists have the responsibility to conceive and conduct research aimed at answering questions that are important. We take this responsibility seriously, and work hard to make the best use of the limited research dollars available. We compete keenly for these resources on the basis of our ideas and track records. We then compete further to give away our hard-won knowledge via peer-reviewed publication in high-quality journals.

• The Forest Service has crucial responsibilities to efficiently and responsibly manage a huge land base of

public lands. This includes seeking and using the best information and scientific thinking available in its management. It must integrate multiple uses while ensuring that its management activities are sustainable and enhance rather than threaten the ecological integrity of these forested ecosystems.

• Congress has the duty to establish overall goals for Forest Service management and 'side-boards' to protect the economic and ecological values of our public lands. You are also responsible for setting priorities for the Forest Service and for monitoring the degree to which this agency lives up to our legislated mandates. I urge you, however, to resist the temptation to micromanage via line-item budgets that have historically favored particular outputs like timber production and populations of game wildlife species. You, too, have a responsibility for wise stewardship and for ensuring that the best science is implemented in land management.

Conclusions

I have been a student of agency and government performance with regard to forest management for the past 15 years. I have thought and written about how best to move the Forest Service forward in adopting a more ecologically informed and economically rational approach to Forest planning and management. We owe the National Forests and the species they support the best in scientifically informed management. This is not a short-term or local responsibility - our descendents will judge us by what we pass on to them.

I see progress on many fronts, including this year's Committee of Scientists Report. Science allows us to foresee the consequences of our management actions, ensuring safer and more rational approaches to long-term management. Science also provides mechanisms for dealing with the dual problems of uncertainty and disagreements as to the relative importance of different processes and threats (via risk analysis, rigorous hypothesis testing, and regular peer review). Thus science can also serve the Forest Service and the American people by providing a credible and less contentious basis for managing our extensive public lands. But in order for science to serve these major functions, it needs to be supported, both in principle and financially. As the relevance and importance of good science grows within the Forest Service, so should the budgets that support critical research activities and management of our wildlife and fisheries resources. In fact, the distinction between research and management is blurring as the Forest Service and other agencies increasingly adopt the paradigm of adaptive management. That is, management actions are increasingly being viewed as landscape-scale experiments and research results are increasingly informing management in a regular and appropriate cycle of information flow.

Please listen to the leading scientists in and outside the Forest Service and resist any measures that might weaken the few safeguards we have for protecting ecosystems and wildlife. Please support the science that gives us the information and tools to understand forest ecosystem and wildlife dynamics, for it is only with these data and tools that we can expect managers to make informed decisions regarding the consequences of their management.

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